IMP. BUR.
27 FEB. 1917
DOM.

UNITED STATES DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN

WASHINGTON, D. C. 768 NOVEMBER 18, 1916

Contribution from the Bureau of Plant Industry, Wm. A. Taylor, Chief.

DWARF BROOM CORNS.

By BENTON E. ROTHGEB,
Scientific Assistant in Grain-Sorghum and Broom-Corn Investigations.

CONTENTS.

	Page.		Page.
Introduction	1	Preparing for market	12
Climatic adaptation of broom corn	1	Grading	12
Varieties	2	Baling	13
Growing the crop	3	Storing	13
Preparing the seed bed	3	Diseases	14
Good seed	5	Treatment for smut	14
Sowing the seed	7	Profit and loss	14
Cultivating broom corn	8	Cost of production	14
Harvesting the brush	8	Marketing	15
Thrashing	9	Yield	15
Curing	10	Use and value of the stover	15

INTRODUCTION.

Broom corn probably was derived from some sorgo with a loose, open head. In Italy the growing of a sorgo of this sort for making clothes brushes dates back more than 350 years. Broom corn has been grown in the United States for at least 118 years, or since 1798.

Sixty years ago the States of New York and Virginia led in the growing of this crop. Then the center of production moved slowly westward to Illinois and the adjacent States. During all of this time most of the crop was of the tall-growing Standard variety. Following this the Dwarf broom corn was produced and the center of production again moved westward. The leading States in broom-corn production are now Oklahoma, Kansas, and Texas, in the order named (fig. 1). Most of the broom corn grown in these and adjacent States is of the Dwarf variety.

CLIMATIC ADAPTATION OF BROOM CORN.

In its requirements broom corn differs little from the other sorghums, making its best growth in a warm, sunny climate. It is

both drought resistant and drought evasive. Like all sorghums, it makes better use of a limited supply of water than does corn. Like corn, its growth is checked by cool nights, even when followed by days of moderate or intense heat. While broom corn may be grown in almost every State in this country it is not commercially profitable except under favorable conditions.

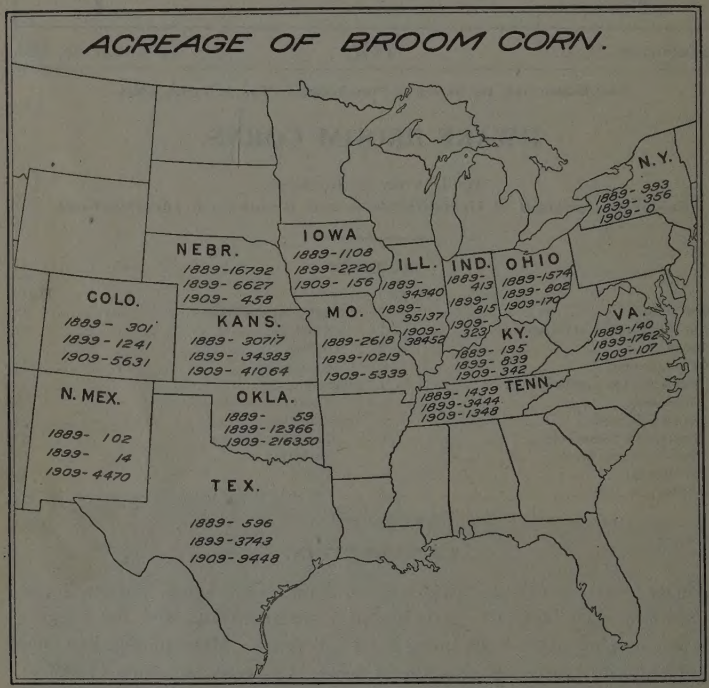

FIG. 1.—Outline map of the Central and Eastern States, showing the acreage of broom corn in each State in the years 1889, 1899, and 1909.

Broom corn is especially suited in many ways to the southern section of the Great Plains area. It supplies the urgent need of the settler for a dependable cash crop on his cheap, new land. It can be grown successfully in spite of the light rainfall and the droughts that mark the climate of that section. The usually dry, sunny weather at and following harvest is favorable for curing the brush, so that it retains its natural green color.

VARIETIES.

There are only three well-marked varieties of broom corn under cultivation in this country. These are the Dwarf, Acme (Dwarf Standard), and Standard. Numerous varietal names are in use, but

they do not represent distinct varieties. Of the three named above the first two are of dwarf size, while the third is tall.

Among the different names that have been applied to the Dwarf broom corn are California Golden Dwarf, Dwarf, Dwarf Evergreen, and Oklahoma Dwarf. The varietal name is not very important. What the grower wants to know is whether he is getting Dwarf, Acme (Dwarf Standard), or Standard broom corn.

Dwarf broom corn makes up about two-thirds of the total broom-corn crop of this country. It does not grow as tall as the Standard, has shorter brush, and the method of harvesting is different. It grows from 4 to 5 or 6 feet in height, according to soil, season, and altitude. The brush varies in length from 15 to 20 or sometimes 24 inches. The fiber is usually much finer in texture than that of the Standard. The peduncle (main stem of the head, or brush) is less firmly attached to the upper node (joint), which allows the brush to be harvested by pulling or "jerking."

The brush of this variety is of the highest value when it is suitable for the manufacture of whisk brooms and brushes, which require a short, fine fiber of good quality. Such brush always brings the top market price. In large, heavy brooms it can be used only for the centers, as it is too short for the outside layers. A lot of broom corn is said to be self-working when entire brooms can be made from it. To be self-working the brush must contain a large percentage of hurl, or fiber 18 or more inches long, suitable for use on the outer layers of the broom.

The Acme (Dwarf Standard) is a variety developed recently from a sport of the Standard broom corn. It resembles the Standard in length of brush and the Dwarf in height. The method of harvesting is the same as for the Dwarf. These characters make it adapted to the southern Plains, where the Dwarf broom corn is grown so extensively. Its chief advantage over the Dwarf variety is the longer brush, which is self-working for ordinary brooms. This variety has been developed within the last few years by the United States Department of Agriculture and is not yet grown commercially. A plat of the Acme variety is shown in figure 2.

GROWING THE CROP.

The cultural requirements of broom corn are practically the same as those of milo, kafir, and corn. Different treatment is required in different sections and seasons and on different soils in the same section.

PREPARING THE SEED BED.

The time and depth of plowing depend largely upon the nature of the soil and the quantity of the winter rainfall. Fall plowing is generally preferable to spring plowing. Heavy soils in districts of considerable winter precipitation will catch more moisture if plowed in the fall and left rough over winter.

Whether the land is plowed in the fall or in the spring, it should be worked with the disk harrow and smoothing harrow into a deep, uniform seed bed. This permits sowing the seeds at a uniform depth. The young plants then emerge at about the same time and the brush develops uniformly.

In the southern section of the Great Plains area listing instead of plowing is common. The lister is essentially a plow with a double moldboard. It cuts a deep, wide furrow, turning the soil on to the unplowed land on either side. Listing differs from plowing, therefore, in that the furrow just made is not filled at the next

FIG. 2.—Plat of Acme (Dwarf Standard) broom corn, 6 to 7 feet tall.

round. The furrows are from $2\frac{1}{2}$ to $3\frac{1}{2}$ feet apart. The land is thus left in alternate furrows and unbroken ridges, the loose soil from the furrows being piled on top of the ridges.

The listing should be done in the fall and the land left over winter in this rough condition. Since the prevailing winds are from the south to southwest or the northwest to north, listing is done east and west where possible. The winter snowfall is held in the lister furrows and thus distributed over the entire field instead of drifting into the fence rows or blowing entirely off the field. When light soils begin to blow in March and April the only effect on listed ground is to move the soil from the ridges into the furrows.

Preparing the seed bed in the spring is done in three ways: (1) By relisting, which is done by breaking the ridges with a lister having a seeder attached, thus listing and sowing the crop at the same time;

(2) by working down the lister ridges with a disk harrow; or (3) by relisting before using the disk harrow to work down the ridges. In either the second or third cases the crop may be surface sown.

GOOD SEED.

The first requisite to the production of good broom corn is good seed. A uniform stand and a uniform crop are necessary to produce the maximum yield of high-quality brush. These can be obtained only by using pure seed of strong vitality. In obtaining seed for sowing one should know not only the quality of the seed, but also the quality of brush from which the seed was thrashed. Broom corn crosses readily with other forms of sorghum, including sorgo, durra, milo, feterita, kafir, etc. These are commonly grown throughout the southern part of the Great Plains area. Seed from such hybrids produces worthless brush. Out of 34 lots of commercial seed grown recently, eight were found to be badly hybridized.

There are three common sources from which seed is obtained: (1) From growers who make a business of growing the seed for sale, (2) from the piles of seed which accumulate at the broom-corn thrashers, and (3) from home-grown seed from the field or seed plat of the grower or his neighbor. There are serious objections to the seed derived from some of these three sources and some objections to the supply now obtained from any of them.

SEED FROM PRIVATE GROWERS.

The seed grown in large quantities by private growers who specialize in broom corn is usually of good quality. Most of these growers, however, are located in States having a humid climate. This seed is not well suited to the dry-land conditions of a large part of the southern Plains area. The broom-corn growers in the drier western parts of Kansas, Oklahoma, and Texas can not get the best results by importing seed from the more humid districts farther east. Western growers should grow their own seed. Each farmer should have his own seed plat or else obtain his seed from some one in his locality who specializes along this line.

SEED FROM BROOM-CORN THRASHERS.

Good seed can not be obtained from broom-corn thrashers. The brush is harvested somewhere between the flowering and early dough stages. The greater part of such so-called seed is immature and will not germinate.

Even if a large percentage of the immature seed is removed by the vigorous use of the fanning mill, that which remains is not desirable for sowing. It is likely to be a mixture of the Dwarf and the Standard varieties. The seed also will have come from brush of all grades. Some may have come from the fine-fibered, short brush; some from heavy, coarse brush; some from tree-top, or spiky brush; and still another part from curly or twisted brush.

One of the most serious objections to seed from the thrasher is the likelihood of getting seed from hybrid plants. Milo, kafir, and sorgo are grown commonly in the districts producing the Dwarf broom corn. Hybrids occur very abundantly. No effect on the plant is seen the first year; that is, in the season when the cross occurs. The seed from these hybrid plants, however, will produce a great mixture of forms, mostly worthless. No matter how much care is taken in cleaning and grading the seed, these hybrid seeds will not be removed.

The likelihood of getting smut-infested seed is very great when seed is obtained from unknown or mixed sources. When smutted seed is sown, unless it is first treated to destroy the disease, there is certain to be a large percentage of smutted brush in the resulting crop. This causes heavy loss to the grower, since smutted brush is of little or no value. It also infests the seed on healthy brush and endangers future crops. The kernel smut, which is the common smut of broom corn, is easily and cheaply destroyed by the formalin or the modified hot-water treatment of the seed. There is no reason for allowing it to reduce quality and profit.

Formalin treatment for kernel smut.—Mix 1 pound of commercial formalin with 30 gallons of water in a tub or barrel. Put the seed in sacks and soak in this solution for one hour, stirring it occasionally. Then drain the sacks and spread the seed on a clean floor or canvas to dry. Clean the floor or canvas and the sacks into which the seed is put with the solution. The seed will be infected again if any untreated smut spores touch it.

The solution may be used also as a spray. In this case spread the seed on a clean floor or canvas and sprinkle with the solution. The seeds must be stirred until all of them are wet. Shovel the seeds into a pile and leave over night covered with a treated canvas to keep in the fumes. In the morning spread out to dry. The soaking or immersion method is more thorough, though perhaps not as convenient as the sprinkling method.

SEED FROM A HOME SEED PLAT.

The home seed plat can be made the ideal place for producing broom-corn seed. The grower can be absolutely sure of the quality of his seed from this source. If the proper precautions are followed, he has seed as good as that produced by any commercial grower.

The surest way to get results is to sow a small plat on one side of the main field with the purest seed obtainable. As the plants approach the heading stage, all which are hybrids or not true to the variety grown, as indicated by different heights, sizes, shapes, or colors, should be removed before they can scatter pollen. As the brush begins to emerge from the boot, the remaining plants of desirable type should be inspected daily. All spiky brush having a strongly de-

veloped central stem should be removed before it flowers and cross-fertilizes the desirable brush. If this work is well done the first year, much less time will be required in the second and succeeding years.

SOWING THE SEED.

The chief problems in sowing are when and how much to sow and how it should be done.

WHEN TO SOW.

Sowing broom corn begins in the southeastern part of Texas as early as April 1. In the southeastern part of Oklahoma it begins about April 15. In western Oklahoma, the Panhandle of Texas, and southwestern Kansas sowing begins about May 10 and continues for about two weeks.

The time differs with the locality and even in the same locality. The seed will not germinate readily in a cold soil, and if sowing is done too early a poor stand may result. On the other hand, late seeding may allow injury from summer drought. Usually the crop is sown about two weeks later than the average date for planting corn in any given locality.

HOW MUCH TO SOW.

Experiments made at the Woodward Field Station, Woodward, Okla., show that one plant every 6 or 8 inches in the row is about right where the rows are 3½ feet apart. This will be true of other localities with similar conditions. Thinner stands may be necessary under very dry conditions. To obtain a stand at any stated rate a thicker sowing will have to be made, as not all of the seeds will grow. Two pounds of good seed are sufficient to sow an acre in dry sections.

The rate of seeding depends somewhat upon the available moisture and the fertility of the soil. On moist, rich soils the crop should be sown at a heavier rate than on poor soils or in dry sections. Thin stands on rich soils tend to produce long, coarse brush. Too thick stands on poor soils or in dry sections produce short brush, or in extreme cases fail to produce brush at all.

METHOD OF SOWING.

Broom corn may be surface sown with an ordinary corn drill or listed with a lister drill. That method should be used which experience with similar crops has proved best for any given locality. Listing is preferable in soils subject to blowing. The young plants at the bottom of the lister furrow are protected from the cutting action of blowing sand or soil grains. In surface-sown crops a complete loss sometimes occurs from this cause.

Either an ordinary corn drill or a lister drill may be fitted with special plates for sowing broom corn. These plates can usually be obtained from the manufacturers or the local implement house. Blank plates may be obtained and drilled by a blacksmith or by the

farmer himself. The number of holes in the plate required to sow a given rate depends to some extent on the speed adjustments of the corn drill. This adjustment differs in the planters of different makes. The speed adjustment of the planter to be used should be learned. Then the number of holes in the plate required for a given rate can be determined. The holes should be three-sixteenths of an inch in diameter and slightly countersunk on the under side, so that the seed will not wedge fast in the hole.

CULTIVATING BROOM CORN.

Cultivation should begin early and be repeated as needed while the plants are small, as they make slow growth and are easily choked by weeds. When the crop is surface sown, a spike-tooth harrow is an efficient tool for the first and second cultivations. Later cultivations are made with an ordinary corn cultivator.

The first harrowing should be given while the seed is germinating, so that no surface crust will be formed to keep the plants from getting out of the ground. The second harrowing should be given just before the plants are large enough to be worked satisfactorily with the cultivator. The listed crop must be cultivated with a lister cultivator. In the first cultivation the disks are set to turn the soil away from the young plants. After this the disks are reversed, to throw the soil toward the plants, thus filling the furrows and leveling the ridges as the cultivations continue.

HARVESTING THE BRUSH.

The value of the brush depends greatly on the care used in harvesting.

WHEN TO HARVEST.

To obtain brush of the best quality, harvesting should be done early. It may be at any time from the beginning of blooming until the seed is in the early dough stage. The exact time depends very largely upon the development of the fiber. The strength of the fiber increases until the natural pea-green color extends from the tip to the base and from the outside to the center of the head. After this time the brush becomes more brittle as the ripening progresses. A large part of the head in the Dwarf and Acme varieties remains inclosed in the leaf sheath, or boot. The condition of the base of the brush can not be judged by noticing only the exposed tip. The base of a number of heads should therefore be examined in order to make certain of the condition of the brush. If harvesting takes place before the green color has developed throughout the base of the brush, the result is a weak base and poor quality.

When the crop is grown for seed, the brush is not harvested until after the seed is fully mature. Ripe brush, however, is of little value for making brooms. The value of such brush depends upon

the climatic conditions previous to harvest and upon the care given the brush after the seed is removed. If ripe brush is not discolored by wet weather but has the natural yellow color of mature brush, it commands about half the price of good brush. It should be cared for and baled the same as the good brush.

METHODS OF HARVESTING.

There are two methods of harvesting broom corn, due to differences in the height of the plants and the strength of the peduncle where it is attached to the upper joint. The Standard broom corn grows so tall that it must be bent over, or tabled, to bring the brush within reach so that it can be cut off.

The brush from Dwarf and Acme broom corns is harvested by pulling or jerking the heads from the standing stalks. Walking down the standing row, the operator takes hold of the sheath, or boot, with one hand and with the other catches the top of the brush and gives it a quick downward and outward jerk. This breaks it from the stalk at the upper joint, leaving about 6 inches of stem with the brush. As the brush is harvested it is placed in piles, either on the ground between the rows or between the stalks in the row. This method of placing the brush is shown in figure 3. The latter method is preferred, as dirt is less likely to be splashed on the brush in case of rain before it is removed to the thrasher or to the rick.

THRASHING.

Removing the seed from the brush is variously termed thrashing, seeding, or scraping. The machine used is constructed especially for this purpose. It consists essentially of two cylinders, one placed above the other, revolving rapidly in opposite directions. The surfaces of both are set with teeth or spikes. In thrashing broom corn, only the part of the head which contains seed passes into the cylinders.

There are now in common use two different makes of these thrashers, one hand fed and the other self fed. In thrashing with the hand-fed machine the feeder stands directly in front of the cylinders. The brush is grasped firmly by the stem at the base and the tip inserted between the cylinders and held there until all the seed is removed. The brush is then withdrawn.

In the self-feeding thrasher the heads are carried to the cylinders by a sprocket belt passing in front of the cylinders and parallel to them. This belt holds the brush firmly by the stems and is so adjusted that only the seed-bearing tip passes between the cylinders. The seed is stripped from the brush as it passes along to be deposited on a table beyond the cylinders. This thrasher has a much larger capacity than those fed by hand.

The small hand-fed thrasher does as good work as the large one and does not require so many men to operate it. Where there is a

large quantity of brush to be thrashed, however, and the required help is available, the larger machine is preferable. Time saved in thrashing shortens the risk of exposure to damage by wet weather.

CURING.

The value of the brush is frequently determined in the process of curing. To a large extent, color and condition govern the price of broom corn. In order that the brush may retain its fresh green color, it must be cured rapidly and not exposed to strong light. There are many methods of curing now in common use. Some of these are not desirable, because a large percentage of damaged brush results.

FIG. 3.—Small piles of brush placed between the broom-corn stalks to cure.

SHED CURING.

The best known method of curing is in a shed built especially for this purpose. A curing shed need not necessarily be expensive. About 1 cubic foot of space is required for each 2 pounds of cured brush. A shed 10 feet high, 16 feet wide, and 24 feet long will contain ample space for green brush which will make about 3½ tons after curing. This is equal to the average yield of about 35 acres of Dwarf broom corn in western Oklahoma, Kansas, or Texas.

A curing shed consists chiefly of a framework of heavy studding 10 feet high to the plate, supporting a roof with widely projecting eaves. The gables are sheeted, but the sides and ends usually are left open to permit free circulation of air. Sometimes the end or

side in the direction from which rains usually come is sheeted also to protect the brush. The roof and sheeting may be made of galvanized iron, lumber, or other suitable material. The eaves should project 4 to 6 feet beyond the framework, to shade the brush from direct sunlight and protect it from rain. In many cases the grower cures his brush in a wagon shed or cattle shed, open on one or two sides. The brush occupies it but a few weeks in summer and leaves it available for other purposes the remainder of the year.

The brush is cured in shallow layers spread on a series of slats. When the shed is 16 feet wide and the posts or studs are set 8 feet apart, the interior is readily separated into sections 8 feet square by setting a row of posts in the center, exactly opposite the studding. Strips of board 1 inch thick, 2 inches wide, and 16 feet long are nailed across the shed on the posts. The first strip is put down near the ground, and the strips are placed 6 inches apart from center to center until the plate is reached. The shelves for the brush are made by laying 2-inch slats in pairs lengthwise of the shed and resting on the cross slats. The members of each pair are just far enough apart to support the brush. These are put in place only as fast as needed while filling the shed.

Filling may be done from one side only, in which case the first layer is placed at the bottom on the opposite side. The next layer is placed above the first, and so on. If filling is done from both sides, the first layer is placed at the bottom in the middle. By these methods no space is wasted in passageways inside the shed.

The brush is spread evenly 2 or 3 inches deep upon the two slats. The brush will not dry quickly if placed more than 3 inches deep on the shelves. It may also become moldy, losing its green color and becoming brittle.

All brush harvested in any one day should be hauled to the shed before night. The following morning this brush should be thrashed and placed on the shelves to dry. When the brush is handled in this manner there will be no loss from weather-stained or bleached brush. By this method the thrashing takes place while the brush is green, and fewer fine tips of the fiber are torn off with the seed than when thrashing is done after the brush is cured.

RICK CURING.

Rick curing is now practiced to a very large extent where Dwarf broom corn is grown. This method is next best to shed curing, but the loss from damaged brush often is considerable. In many cases the difference in price in favor of shed-cured brush is so large that the loss on a few tons of rick-cured brush will pay the cost of the curing shed. This is especially true when damp and rainy weather occurs during the time the brush is curing.

In rick curing, the brush is dropped in small piles between the stalks in the row as it is jerked. Each pile contains two or three handfuls. Here it remains for several days, until it is about half cured. It is then hauled and placed in ricks. In these it is left until thoroughly dry, when it is ready to be thrashed and baled. The ricks are made narrow, placing the heads with tops out and butts in, lapping the middles just enough to shed water in case of rain. The ricks should be built 4 or 5 feet high and as long as desired (fig. 4). They are covered with broom-corn stalks or anything else that will shed rain and shield the brush from the direct rays of the sun. When cured in a rick, thrashing must not be done until after the brush is cured, as the brush without the seed packs so closely and excludes the air to such an extent that it "stack burns." The brush should not be baled until it is so dry that the butts will break off

FIG. 4.—Rick-cured broom corn ready for the thrasher.

when bent back and forth. The thrashing and baling of rick-cured broom corn are shown in figure 5.

PREPARING FOR MARKET.

The market value of the brush depends to a large degree upon the care with which grading, baling, and storing are done. Much of the season's profit may be lost after the crop is cured.

GRADING.

A common source of loss to the broom-corn grower is the prevalent practice of baling the crop without grading. Everything harvested in the field is put together to form the bale, which is the unit in the selling transaction. Where good and poor brush are mixed, the buyer must always be on the safe side. The percentage of poor brush will be estimated a little higher than appearances indicate. The price paid under such circumstances usually is less than the

average price the good brush and poor brush would have brought if baled separately. The grower will be repaid for the time and labor of grading his brush and baling each grade separately. Crooked heads, heads with twisted or kinky fiber, and those containing a large center stem are of poor quality and should be separated from the good brush. Grading can be done conveniently either when the brush is being taken from the field or after it is thrashed and just before the baling is done.

BALING.

All commodities offered for sale command a better price when put up in neat and attractive parcels. This is true with broom corn. The bales should have a neat appearance when finished, with all the wires tight and securely fastened (fig. 6). To accomplish this it is

FIG. 5.—Thrashing and baling 100 acres of rick-cured broom corn in Oklahoma.

essential that the heads be laid straight in the baler. The brush should be taken up in small armfuls and butted against a board, so that all the butts are even. The butts then should be placed firmly against the end of the baler. The butts of one armful are placed against one end and those of the next armful against the other end. This process is continued until the baler is full. Pressure is then applied, the bale pressed into shape, and the wires fastened. A good square bale may be made by filling in this way if the bale is pressed tightly and the wires properly adjusted to hold it in shape.

STORING.

If the bales are not sold directly after baling they should be stored in a dry, dark place for protection against the weather and sunlight. Otherwise, the outside of the bales will be weather stained or bleached by the sun and will not command as high a price as if kept in good condition.

DISEASES.

Broom corn, like other sorghums, is affected by two kinds of smut, the kernel smut[1] and the head smut.[2]

The kernel smut is much the more common of the two and may cause great loss if not kept under control. This smut is easily recognized. The head retains its usual form and nearly its usual appearance, but the kernels are replaced by black masses of smut spores. The fiber is more brittle than that from noninfested heads.

Head smut affects the plant in quite a different way. The whole head is converted into a large smut mass covered by a whitish membrane, which soon bursts and sets free the black mass of spores. When this smut occurs the brush is an entire loss.

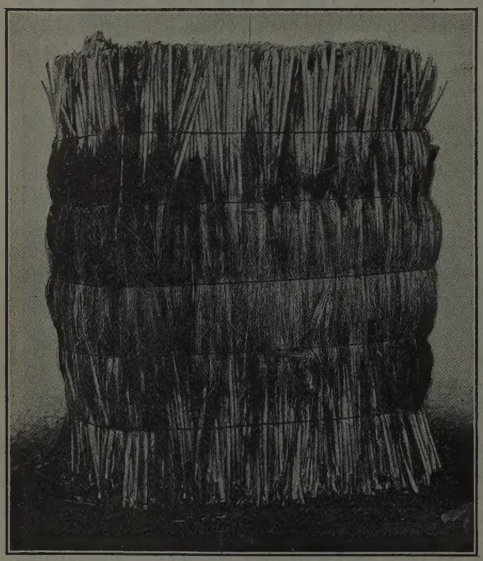

FIG. 6.—A well-made bale of broom corn.

TREATMENT FOR SMUT.

Kernel smut can be entirely destroyed by treating the seed. Brief directions for applying the formalin treatment have been given in the discussion of good seed (p. 6).

There is no known seed treatment effective against head smut. It is not abundant except in small districts. If possible, keep it off the farm. When it is present the plants should be gathered and burned before the spores are scattered by the wind.

PROFIT AND LOSS.

The profit or loss on a broom-corn crop depends largely upon the cost of production, the yield, and the market price of the brush. It is an expensive crop to produce, because of the large amount of hand labor and the special machinery required to care for the brush properly.

COST OF PRODUCTION.

The cost of production varies in different localities, due to differences in land values and in the cost of labor. It costs little, if

[1] *Sphacelotheca sorghi.* [2] *Sphacelotheca reiliana.*

any, more in any given locality, however, to produce a good grade of brush than a poor one. Successful growers in Kansas and in Oklahoma have placed the cost at from $35 to $50 a ton. The cost of the special machinery, such as the thrasher and the baler, may be much reduced to each grower if purchased by several growers in common. The labor problem may also be partly solved by combining forces when labor is scarce.

MARKETING.

Broom corn is a crop in the growing of which community cooperation is greatly needed, for the reasons already mentioned. There are still other reasons. Where grown extensively, the brush can be shipped in carload lots, which makes a saving in freight rates. The brush may be marketed to better advantage in a community where much of it is grown, for the manufacturers are more likely to send an experienced buyer into such a community. It is possible, too, for a community to grow a uniform grade of brush which will be recognized and sought by the manufacturer.

Good brush always brings a much higher price than poor brush. The prices of all grades vary widely in different years and sometimes in the same season, depending upon the supply. When the production is large and much of the crop is of poor quality the prices drop very low on all grades. Under such conditions the poorer grades may sell for $20 or $25 a ton, while the better grades bring from $50 to $60 a ton. When there is a scarcity prices are much higher, sometimes reaching $250 per ton for the best quality of brush. Normally, the market price for good brush ranges from $75 to $100 per ton. Practically all the brush is consumed in this country, and the price is therefore governed by the home market.

YIELD.

During the last 30 years more than 93 per cent of the brush produced in the United States has been grown in 16 States. The acre yields in each of these States, taken from the United States Census, for the years 1889, 1899, and 1909, with the average yields in the three years, are shown graphically in figure 7. It will be noted that Oklahoma has the lowest average yield; yet that State produced 21,371 tons of brush in 1909, which was about 55 per cent of the total crop in that year. The total production in each of the three years was 19,278, 45,475, and 39,479 tons, respectively.

USE AND VALUE OF THE STOVER.

Broom-corn stover consists of the stalks and leaves remaining after the brush is removed. It is easily harvested with a row binder, or it may be cut with a mowing machine. It may be used either as silage or dry roughage, and may also be pastured. Broom corn as stover is thought to be worth about as much as sorghum stover or

corn stover. It is, of course, worth much less than kafir fodder or corn fodder, because these contain grain in addition to the stalks

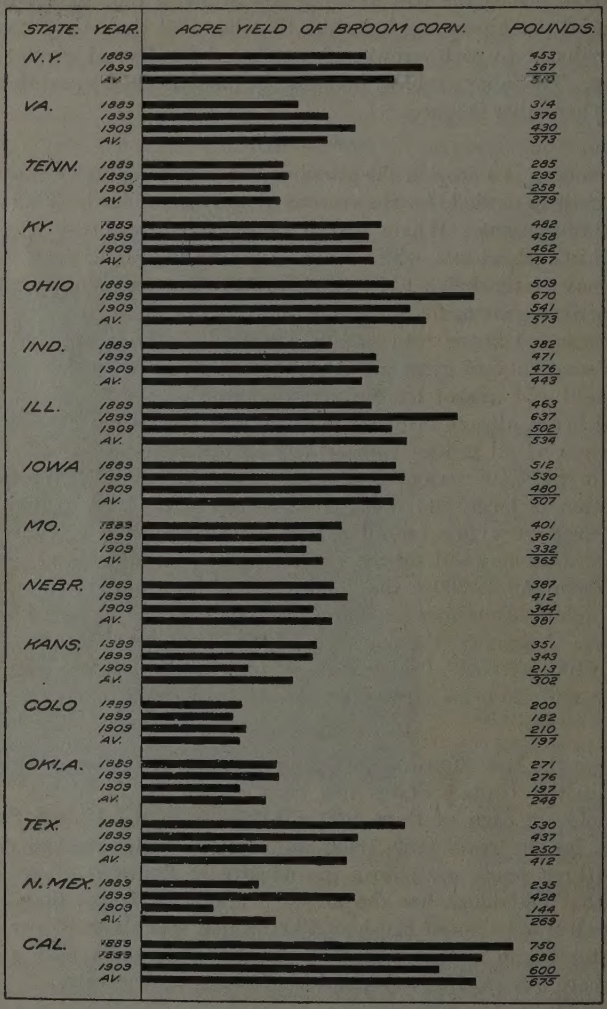

FIG. 7.—Diagram showing the acre yields, in pounds of brush, in the 16 States growing broom corn in the years 1889, 1899, and 1909, and the average yields for the three years.

and leaves. The value of broom-corn stover from which the brush has been pulled at the right period is estimated to be $1 to $3 per acre, depending upon the quality and quantity.

WASHINGTON: GOVERNMENT PRINTING OFFICE: 1916